

PERSONALITY

John Gabrieli

9.00

Personality

- 1. Definition - What is it?**
- 2. Personality Factors**
- 3. Traits, States, Contexts**
- 4. Brain Correlates of Personality**

INDIVIDUALITY

Every person is in certain respects:

- **Like all other persons,**
- **Like some other persons,**
- **Like no other person.**

adapted from Kluckhohn & Murray, 1948

Personality

A set of behavioral, emotional, and cognitive tendencies that people display over time and across situations and that distinguish individuals from one another.

Personality

A set of behavioral, emotional, and cognitive tendencies that people display over time and across situations and that distinguish individuals from one another.

- TRAITS (constant, continuum)
- STATES (temporary)
- SITUATIONS (contexts)

Personality

- **18,000 terms for personality**
affable, agreeable, amiable, amicable, congenial, convivial, cordial, friendly, genial, sociable, welcoming
- *trait theory - manageable set of personality dimensions*

Personality

How can we measure?

- **Interview**
- **Observation**
- **Inventory/Questionnaire**

Factor Analysis

Big Five Personality Dimensions

Factor Analysis

- **analyze patterns of correlation to extract factors that underlie the correlations**
- ***carefree, compliant, dependable, hard-working, kind, rude, trusting* on a 1-5 scale (social desirability concern)**

Hypothetical matrix of correlations among adjectives used as personality self-descriptions

Self-Description	Compliant	Dependable	Hard-Working	Kind	Rude	Trusting
Carefree	-.11	-.60	-.43	+.01	+.21	+.17
Compliant	–	+.29	+.13	+.39	-.70	+.53
Dependable		–	+.49	+.19	-.13	+.17
Hard-Working			–	+.08	-.11	+.09
Kind				–	-.65	+.55
Rude					–	-.48
Trusting						–

Chart showing possible correlations among adjectives used to describe personality in oneself.

Image by MIT OpenCourseWare.

Factor Analysis

- analyze patterns of correlation to extract factors that underlie the correlations - independent factors
- label the factor (dimension)
 - “conscientiousness”
 - carefree, dependable, hard-working
 - “agreeableness”
 - compliant, kind, rude

Costa and McCrae's (1992) NEO PI-R Facets

Big Five Dimensions	Facet (and correlated trait adjective)
O Openness versus closedness to experience	Ideas (curious) Fantasy (imaginative) Aesthetics (artistic) Actions (wide interests) Feelings (excitable) Values (unconventional)
C Conscientiousness versus lack of direction	Competence (efficient) Order (organized) Dutifulness (not careless) Achievement striving (thorough) Self-discipline (not lazy) Deliberation (not impulsive)
E Extraversion versus introversion	Gregariousness (sociable) Assertiveness (forceful) Activity (energetic) Excitement-seeking (adventurous) Warmth (outgoing)
A Agreeableness versus antagonism	Trust (forgiving) Straightforwardness (not demanding) Altruism (warm) Compliance (not stubborn) Modesty (not show-off) Tender-mindedness (sympathetic)
N Neuroticism versus emotional stability	Anxiety (tense) Angry hostility (irritable) Depression (not contented) Self-consciousness (shy) Impulsiveness (moody) Vulnerability (not self-confident)

The Big Five Inventory (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who *likes to spend time with others*? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

1. Disagree strongly
2. Disagree a little
3. Neither agree nor disagree
4. Agree a little
5. Agree strongly

I See Myself as Someone Who...

- __1. Is talkative
- __2. Tends to find fault with others
- __3. Does a thorough job
- __4. Is depressed, blue
- __5. Is original, comes up with new ideas
- __6. Is reserved
- __7. Is helpful and unselfish with others
- __8. Can be somewhat careless
- __9. Is relaxed, handles stress well
- __10. Is curious about many different things

- __9. Is relaxed, handles stress well
- __10. Is curious about many different things
- __11. Is full of energy
- __12. Starts quarrels with others
- __13. Is a reliable worker
- __14. Can be tense
- __15. Is ingenious, a deep thinker
- __16. Generates a lot of enthusiasm
- __17. Has a forgiving nature
- __18. Tends to be disorganized
- __19. Worries a lot
- __20. Has an active imagination
- __21. Tends to be quiet
- __22. Is generally trusting
- __23. Tends to be lazy
- __24. Is emotionally stable, not easily upset
- __25. Is inventive
- __26. Has an assertive personality

- __27. Can be cold and aloof
- __28. Perseveres until the task is finished
- __29. Can be moody
- __30. Values artistic, aesthetic experiences
- __31. Is sometimes shy, inhibited
- __32. Is considerate and kind to almost everyone
- __33. Does things efficiently
- __34. Remains calm in tense situations
- __35. Prefers work that is routine
- __36. Is outgoing, sociable
- __37. Is sometimes rude to others
- __38. Makes plans and follows through with them
- __39. Gets nervous easily
- __40. Likes to reflect, play with ideas
- __41. Has few artistic interests
- __42. Likes to cooperate with others
- __43. Is easily distracted
- __44. Is sophisticated in art, music, or literature

The Big Five Inventory (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who *likes to spend time with others*? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

- | | | |
|-------------------------------|---|---|
| 1. Disagree strongly | ___9. Is relaxed, handles stress well | ___27. Can be cold and aloof |
| 2. Disagree a little | ___10. Is curious about many different things | ___28. Perseveres until the task is finished |
| 3. Neither agree nor disagree | ___11. Is full of energy | ___29. Can be moody |
| 4. Agree a little | ___12. Starts quarrels with others | ___30. Values artistic, aesthetic experiences |
| 5. Agree strongly | ___13. Is a reliable worker | ___31. Is sometimes shy, inhibited |
- I See Myself as Someone Who...*
- | | | |
|---|--|--|
| ___1. Is talkative | ___14. Can be tense | ___32. Is considerate and kind to almost everyone |
| ___2. Tends to find fault with others | ___15. Is ingenious, a deep thinker | ___33. Does things efficiently |
| ___3. Does a thorough job | ___16. Generates a lot of enthusiasm | ___34. Remains calm in tense situations |
| ___4. Is depressed, blue | ___17. Has a forgiving nature | ___35. Prefers work that is routine |
| ___5. Is original, comes up with new ideas | ___18. Tends to be disorganized | ___36. Is outgoing, sociable |
| ___6. Is reserved | ___19. Worries a lot | ___37. Is sometimes rude to others |
| ___7. Is helpful and unselfish with others | ___20. Has an active imagination | ___38. Makes plans and follows through with them |
| ___8. Can be somewhat careless | ___21. Tends to be quiet | ___39. Gets nervous easily |
| ___9. Is relaxed, handles stress well | ___22. Is generally trusting | ___40. Likes to reflect, play with ideas |
| ___10. Is curious about many different things | ___23. Tends to be lazy | ___41. Has few artistic interests |
| | ___24. Is emotionally stable, not easily upset | ___42. Likes to cooperate with others |
| | ___25. Is inventive | ___43. Is easily distracted |
| | ___26. Has an assertive personality | ___44. Is sophisticated in art, music, or literature |

Please check: Did you write a number in front of each statement?

BFI scale scoring ("R" denotes reverse scored items):

Extraversion: 1, 6R, 11, 16, 21R, 26, 31R, 36; Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42; Conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38, 43R; Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39; Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44

Note: Copyright ©1991 by Oliver P. John. Reprinted with permission.

Big Five inventory (c) 2000 by UC Berkeley psychologist Oliver P. John, Ph.D. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/fairuse>.

The Big Five Inventory (BFI)

Conscientiousness

I See Myself as Someone Who...

- ___1. Is talkative
- ___2. Tends to find fault with others
- ___3. Does a thorough job
- ___4. Is depressed, blue
- ___5. Is original, comes up with new ideas
- ___6. Is reserved
- ___7. Is helpful and unselfish with others
- ___8. Can be somewhat careless
- ___9. Is relaxed, handles stress well
- ___10. Is curious about many different things
- ___11. Is full of energy
- ___12. Starts quarrels with others
- ___13. Is a reliable worker
- ___14. Can be tense
- ___15. Is ingenious, a deep thinker
- ___16. Generates a lot of enthusiasm
- ___17. Has a forgiving nature
- ___18. Tends to be disorganized
- ___19. Worries a lot
- ___20. Has an active imagination
- ___21. Tends to be quiet
- ___22. Is generally trusting
- ___23. Tends to be lazy
- ___24. Is emotionally stable, not easily upset
- ___25. Is inventive
- ___26. Has an assertive personality
- ___27. Can be cold and aloof
- ___28. Perseveres until the task is finished
- ___29. Can be moody
- ___30. Values artistic, aesthetic experiences
- ___31. Is sometimes shy, inhibited
- ___32. Is considerate and kind to almost everyone
- ___33. Does things efficiently
- ___34. Remains calm in tense situations
- ___35. Prefers work that is routine
- ___36. Is outgoing, sociable
- ___37. Is sometimes rude to others
- ___38. Makes plans and follows through with them
- ___39. Gets nervous easily
- ___40. Likes to reflect, play with ideas
- ___41. Has few artistic interests
- ___42. Likes to cooperate with others
- ___43. Is easily distracted
- ___44. Is sophisticated in art, music, or literature

Please check: Did you write a number in front of each statement?

BFI scale scoring ("R" denotes reverse scored items):

Extraversion: 1, 6R, 11, 16, 21R, 26, 31R, 36; Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42; Conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38, 43R; Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39; Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44

Note: Copyright ©1991 by Oliver P. John. Reprinted with permission.

Big Five inventory (c) 2000 by UC Berkeley psychologist Oliver P. John, Ph.D. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/fairuse>.

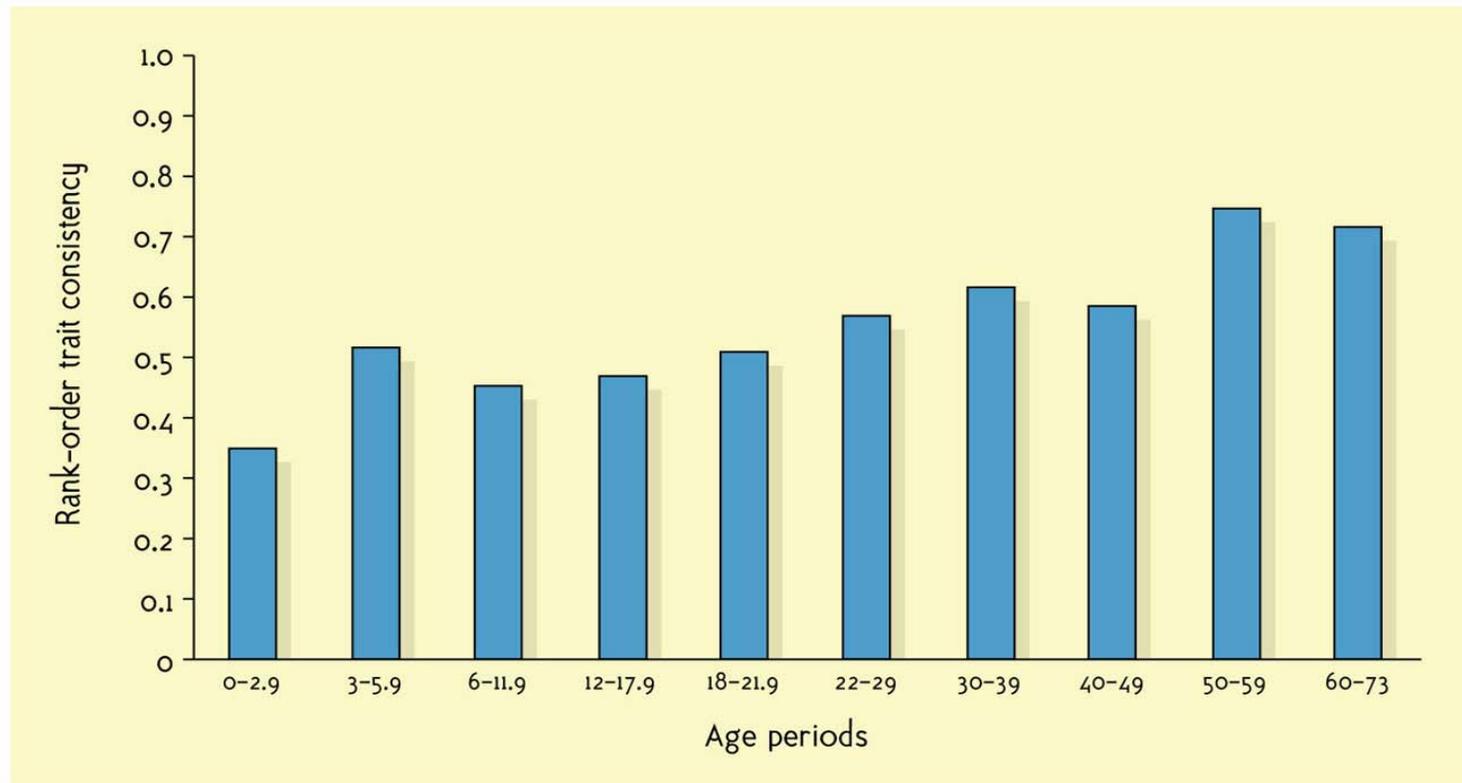
Measures of Personality

- **are they stable across life?**
- **do they predict behaviors and outcomes?**

Measures of Personality

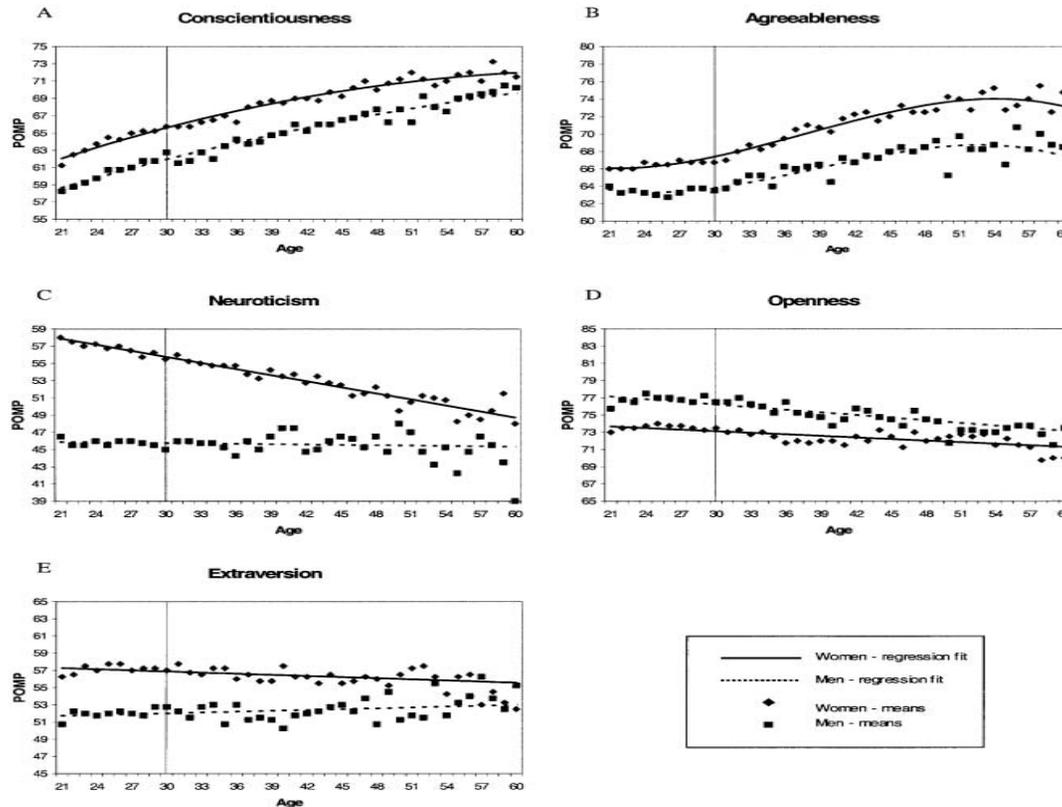
- **correlated .50 to .70 across 30 or 40 years (height & sex correlate .40)**
- **increases with age (7-year periods)**
 - childhood - .31**
 - young adulthood - .54**
 - age 30 - .64**
 - age 50-70 - .74**

Traits remain stable over time (and become more stable with time)



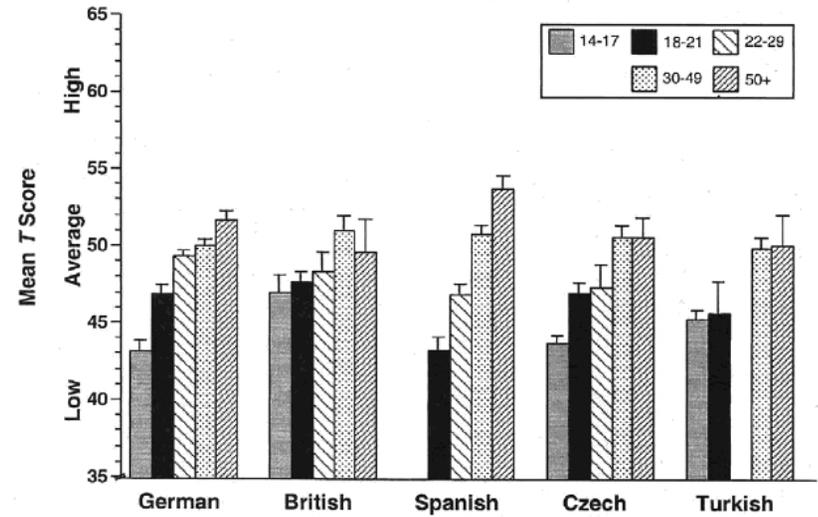
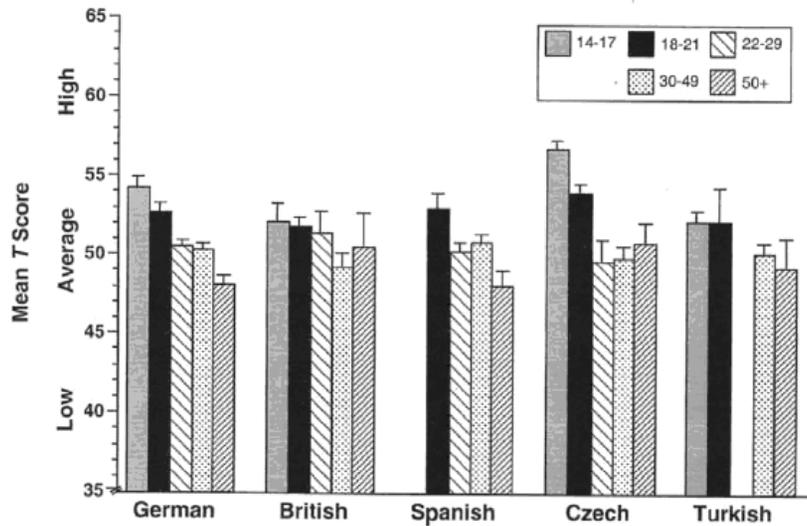
Courtesy of American Psychological Association. Used with permission. Source: Roberts, Brent W., and Wendy F. DelVecchio. "The Rank-Order Consistency of Personality Traits from Childhood to Old Age: A Quantitative Review of Longitudinal Studies." *Psychological Bulletin* 126, no. 1 (2000): 3-25.

STABILITY OF PERSONALITY SCORES



Courtesy of American Psychological Association. Used with permission.

Average Big Five scores vary somewhat with age and sex. This graph depicts the mean score for men and women on each of the Big Five traits as a function of age. The results are derived from a sample of 132,515 adults, aged 21-60, who completed a version of the Big Five Personality Inventory that was posted on the Internet. Other studies, using more systematically chosen samples, have shown similar results. (Adapted from Srivastava & others, 2003, p. 1047)



Courtesy of American Psychological Association. Used with permission. Source: McCrae, R., et al. "Nature Over Nurture: Temperament, Personality, and Life Span Development." *Journal of Personality and Social Psychology* 78, no. 1 (2000): 173-86.

Measures of Personality

- **high *neuroticism***
 - **pay more attention to threat in environment**
 - **more stress when given surprise math test**
 - **higher divorce rate**
 - **more susceptible to depression and anxiety**

Measures of Personality

- **high *extraversion***
 - **attend more parties, more popular**
 - **identified as leaders in college**
 - **live with and work with more people**
 - **less disturbed by sudden loud sounds or intense stimuli**

Measures of Personality

- **high *agreeableness***
 - **more willing to lend money**
 - **higher school grades in childhood**
 - **fewer arrests as adults**

Measures of Personality

- **high *openness to experience***
 - **more likely to major in humanities**
 - **change careers in midlife**
 - **perform better in job training programs**
 - **play a musical instrument**

Measures of Personality

- **high *conscientiousness***
 - **more sexually faithful to spouses**
 - **higher job ratings**
 - **smoke less, drink less, drive more safely, live longer, less risk for Alzheimer's disease (89% less)**
 - **play a musical instrument**

Personality

NATURE (genetics)

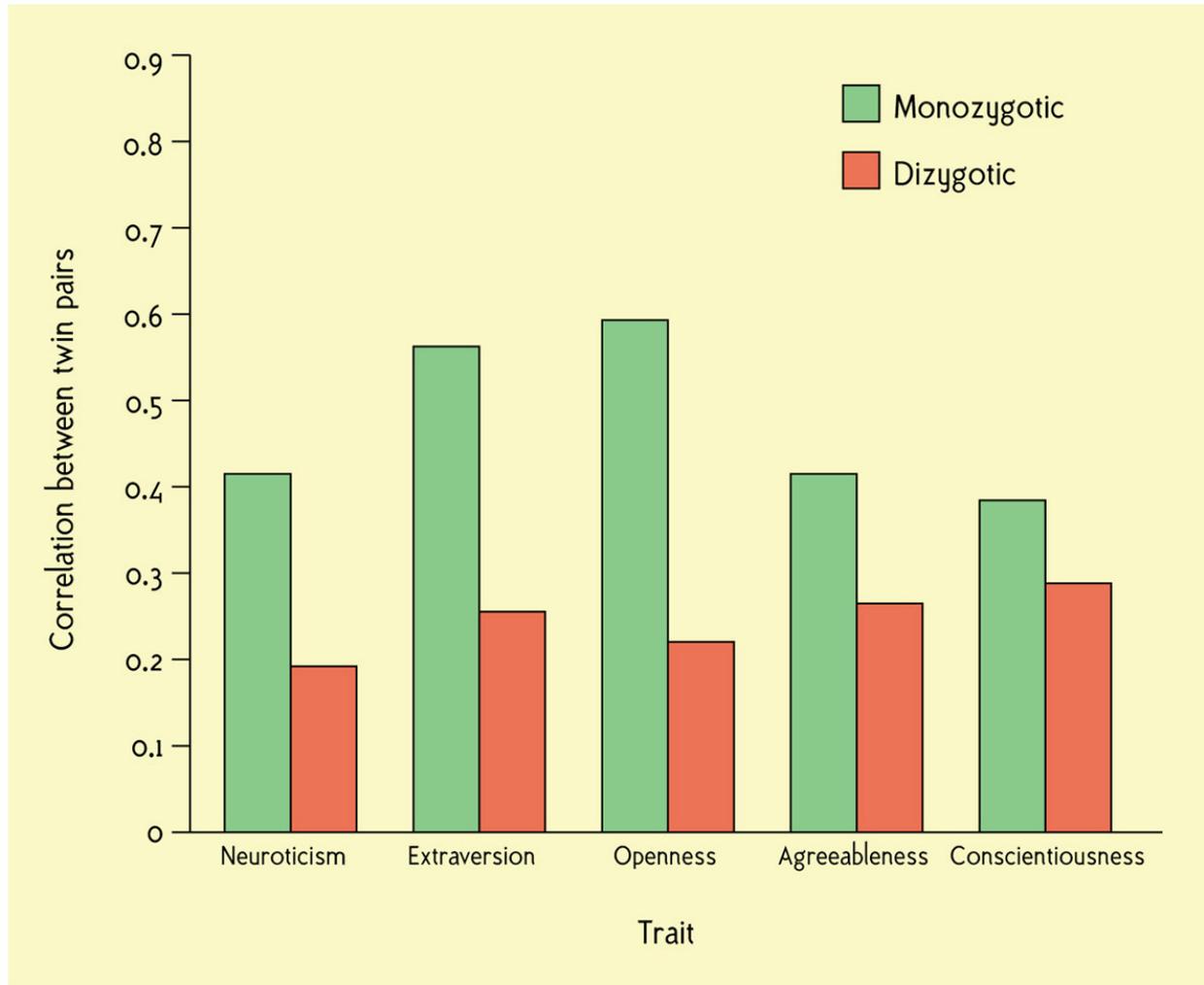
NURTURE (environment)

Twin Studies

monzygotic vs. dizygotic twins

reared together vs. reared apart

Personality is (partly) rooted in genetics: Twin studies



Personality

GENETICS

Twin Studies-Specific Behaviors

time spent watching television

number of childhood accidents

tendency for marriage and divorce

religious attitudes

work/leisure interest (.50)

happiness (.50)

Personality

NATURE (genetics)

NURTURE (environment)

Twin Studies

monzygotic vs. dizygotic

reared together vs. reared apart (same)

environmental factors - parents?

PERSONALITY

- **identical twins reared apart - both very neat**

“My mother. When I was growing up she always kept the house perfectly ordered... I learned from her. What else could I do?”

“The reason is quite simple. I’m reacting to my mother, who was a complete slob.”

Personality

- **biological, non-twin siblings were far more similar to one another than adoptive siblings (*genetics?*)**
- **for personality, children no more similar to adoptive sibling than two randomly selected children**
 - **family plays little or no role?**
 - **does personality fix the environment?**
 - **sibling contrast? split-parent identification?**

PERSONALITY PSYCHOLOGY vs. SOCIAL PSYCHOLOGY

Why do we do things?

Who we are (personality)

Situation we are in (social context)

Personality

- **SITUATIONS**

Mischel & Peake - 1982 -

***conscientiousness* - 19 behaviors -**

making bed, attend class, complete assignments, neat class notes -

consistent with situations, not across situations - *situationism*

Variation of Verbal Aggression Across Situations

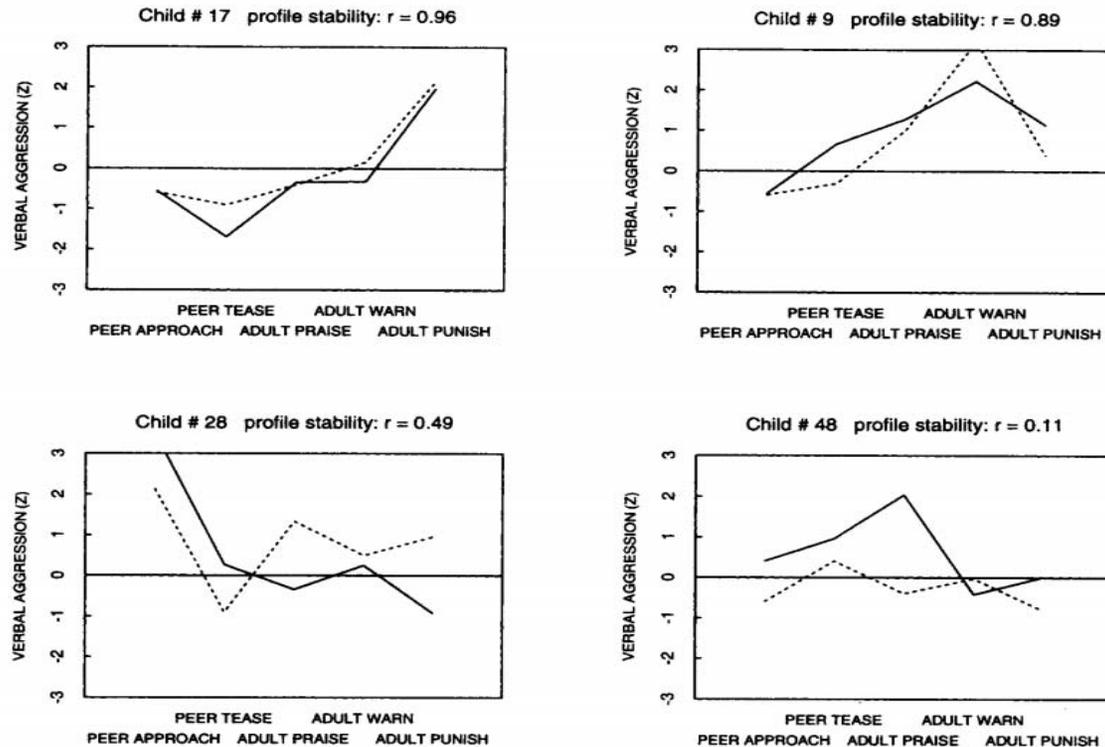


Figure 1. Illustrative intraindividual profiles of verbal aggression across five types of psychological situations. The two lines indicate the profiles based on two different, nonoverlapping samples of occasions in which the child encountered each type of psychological situation, shown as Time 1 (solid) and Time 2 (broken).

Situation-specific profiles of verbal aggression for two children. Shoda, Mischel, and Wright (1994) recorded various categories of behaviors among emotionally disturbed children in various social situations at a summer camp. Shown here are results concerning verbal aggressiveness for two children. Zero on the y axis represents the average aggressiveness for all the children observed. In overall verbal aggressiveness, these two children were similar, but they were very different with respect to the situations that elicited their aggression.

Courtesy of American Psychological Association. Used with permission. Source: Shoda, Y., et al. "Intraindividual Stability in the Organization and Patterning of Behavior: Incorporating Psychological Situations into the Idiographic Analysis of Personality." *Journal of Personality and Social Psychology* 67, no. 4 (1994): 674-87.

Personality

Temperament - innate, biologically based
propensity to engage in a certain style
of behavior

broader than traits - observable

activity level

emotionality

sociability

Personality

Temperament - SHYNESS

- **some babies (6 weeks) more reactive to environmental stimuli - fussy - 15-20%**
- **“high-reactive” or “inhibited” babies (vs. “low reactive”) - more crying, distress, motor activity, faster heart rates, higher levels of cortisol**
- **faster heart rate in womb more likely to be reactive - sympathetic nervous system easily aroused, seek less arousing situation, inhibited**

Personality

Temperament - SHYNESS

- **Signs of inhibition at 2 months or 4 months predict shyness in later childhood and adulthood**
- **25% however are inhibited as infants but not shy in later childhood**

Personality

- **over 1,000 children born in a year categorized as “well adjusted” or “inhibited” or “undercontrolled” at age 3**
- **97% examined at age 21**

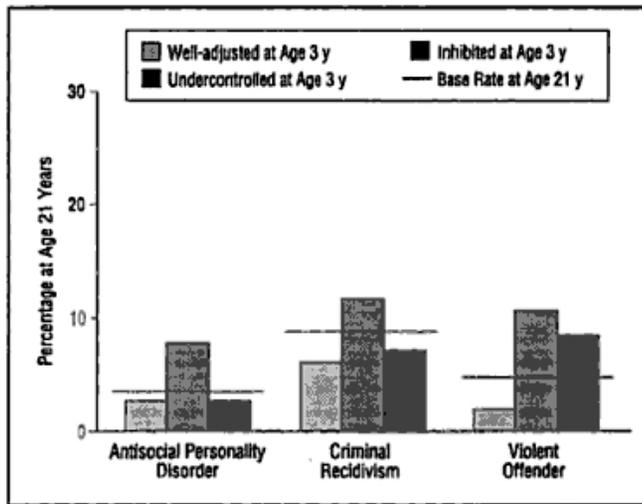


Figure 2. The association between behavior styles at age 3 years and adult criminal behavior.

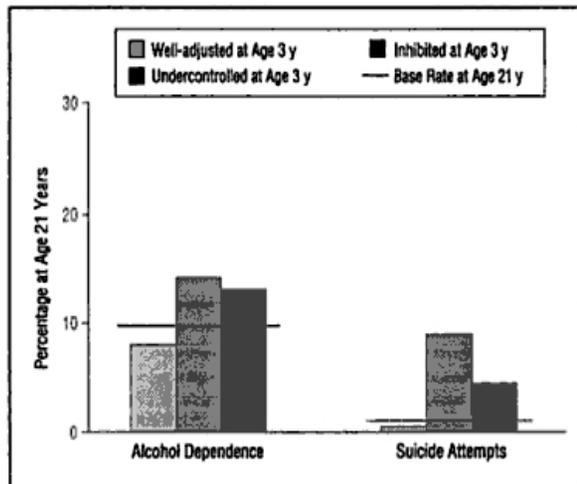


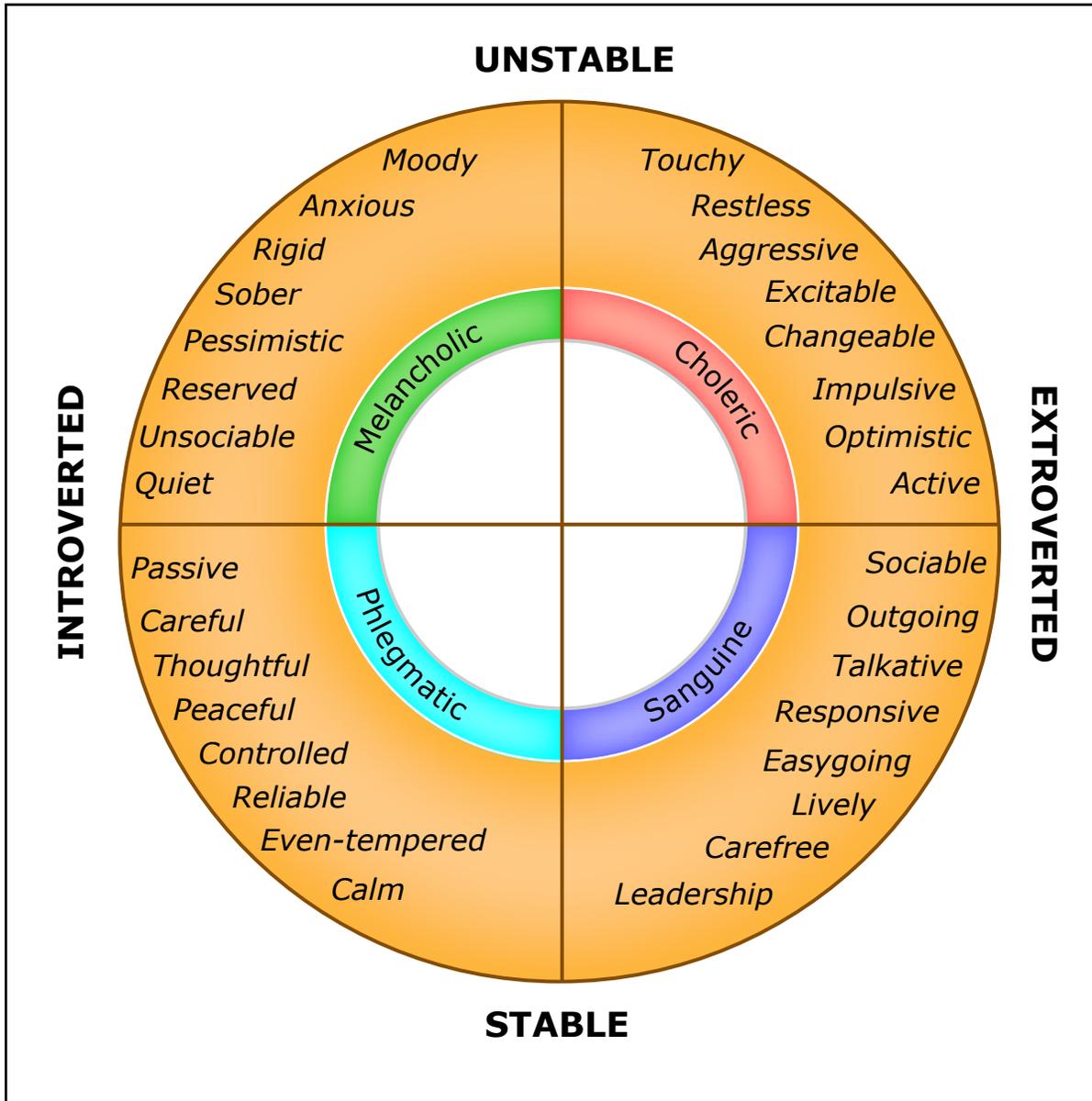
Figure 3. The association between behavior styles at age 3 years and adult alcohol dependence and suicide attempts.

© American Medical Association. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/fairuse>. Source: Capsi, A., et al. "Behavioral Observations at Age 3 Years Predict Adult Psychiatric Disorders." *Arch Gen Psychiatry* 53, no. 11 (1996): 1033-39.

Personality

Temperament - SENSATION SEEKING

- pursuit of novel, high-stimulation situations
- diving, fast driving, drug/alcohol use, flame e-mails, punk music, driving accidents
- lower levels of MAO-B in blood, may allow dopamine to last longer at synapse



Personality

Eysenck

Extraversion/Introversion

- **extraverts less easily aroused, seek stimulation**
- **introverts already aroused, seek quiet**
- **optimal level of arousal**
- **extraverts do better in a noisy settings**
- **introverts more sensitive to pain, salivate more to lemon juice**

Personality

- **SITUATION/PERSONALITY INTERACTIONS**

Introversion/extraversion

Time of day (am or pm)

Caffeine (or not)

Take a test - if introvert, drink coffee in pm

If extravert - drink coffee in am

Personality

Introversion/extraversion

Time of day

Caffeine - increases arousal

Introverts more aroused in am, less in pm

Extraverts more aroused in pm, less in am

Take a test - if introvert, drink coffee in pm

If extravert - drink coffee in am

The Yerkes-Dodson Law

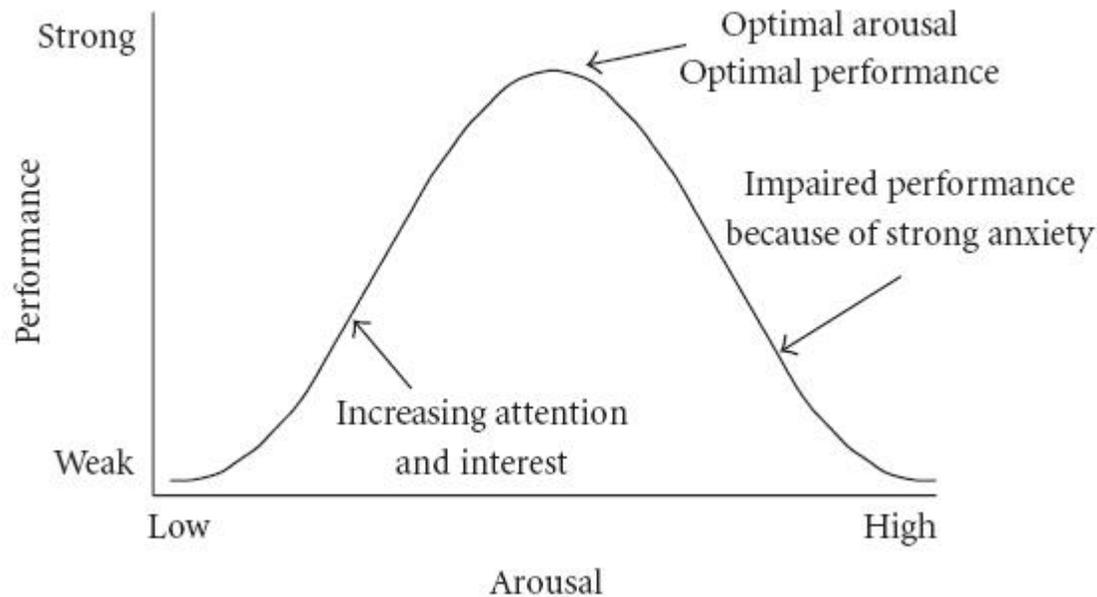


Image is Figure 3 from Diamond D. M., et al. "The Temporal Dynamics Model of Emotional Memory Processing: A Synthesis on the Neurobiological Basis of Stress-Induced Amnesia, Flashbulb and Traumatic Memories, and the Yerkes-Dodson Law." *Neural Plasticity* 33 (2007). [dx.doi.org/10.1155/2007/60803](https://doi.org/10.1155/2007/60803).

The Yerkes-Dodson Law

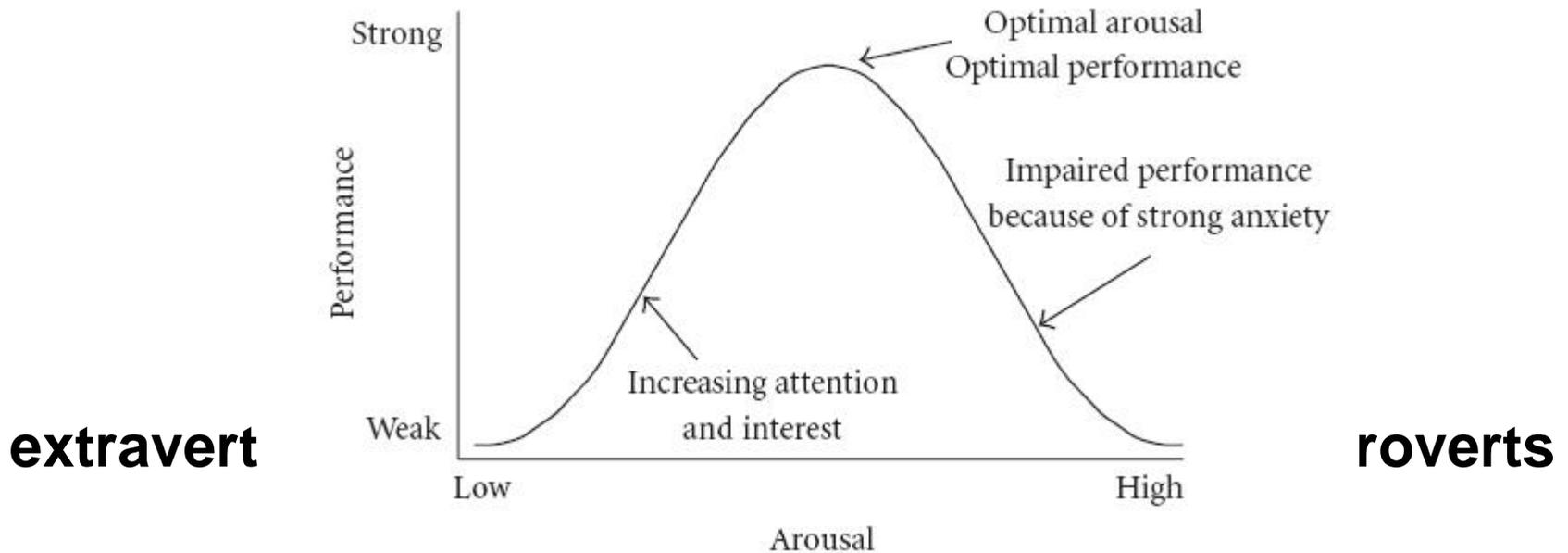
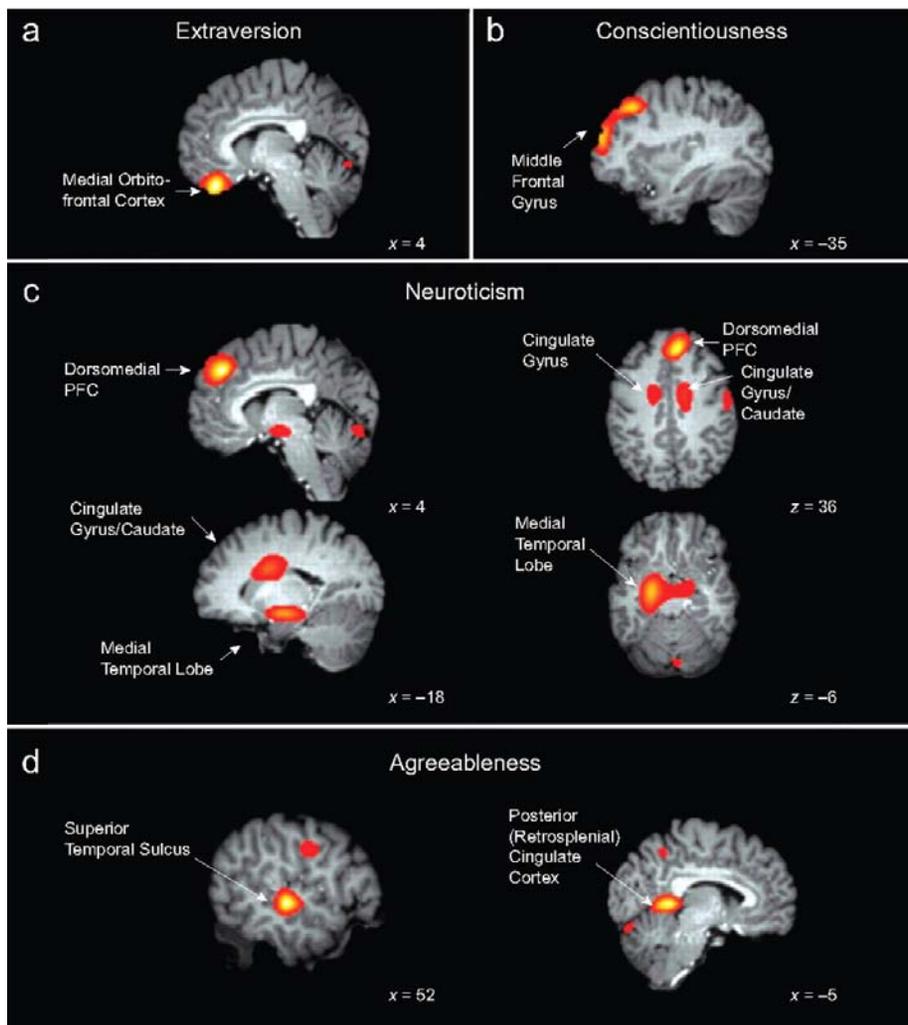


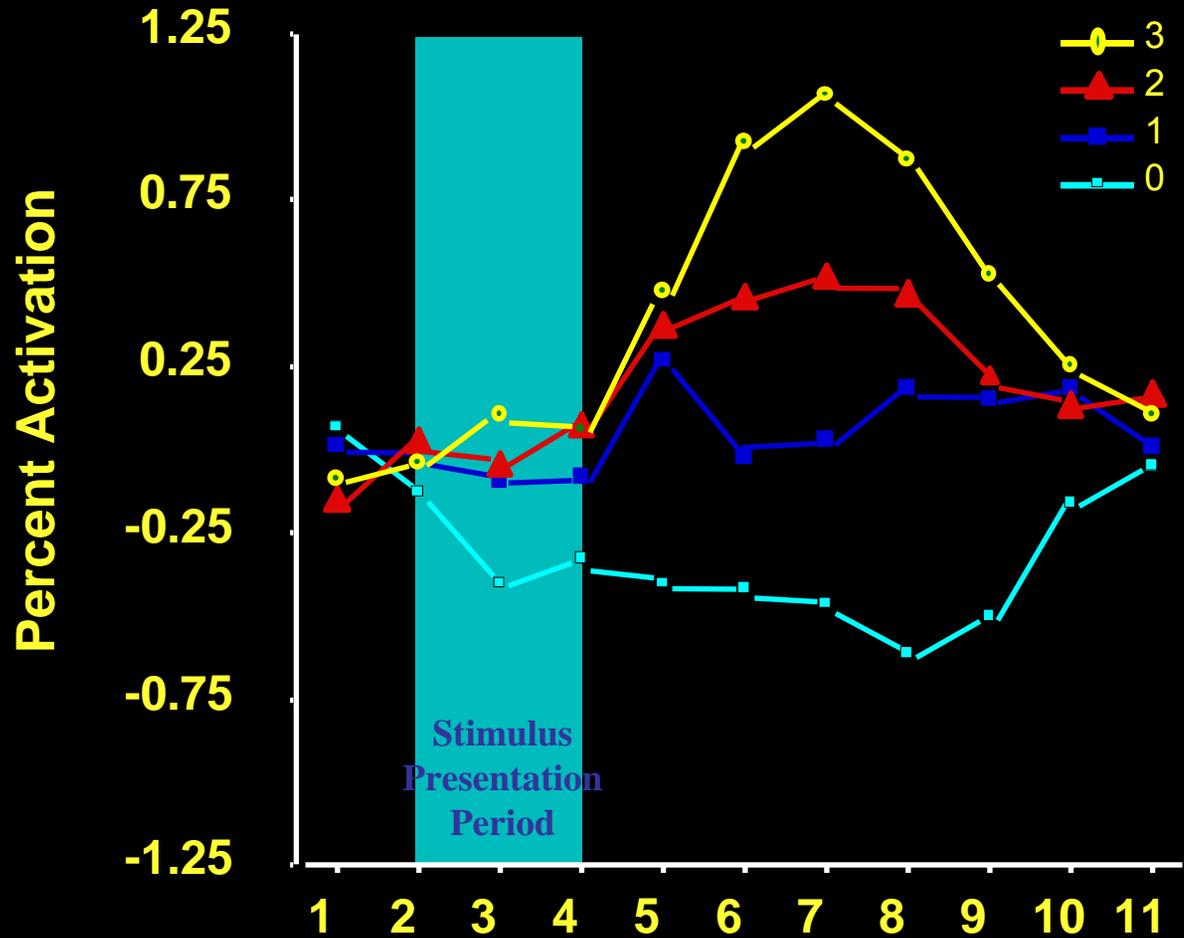
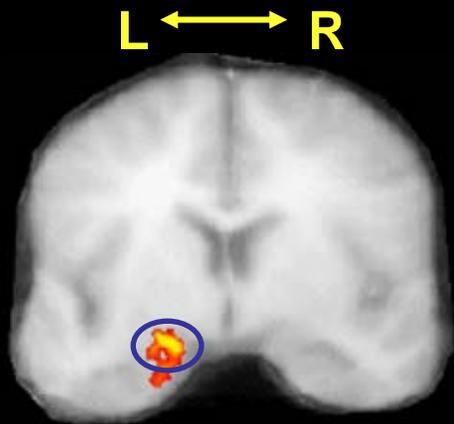
Image is Figure 3 from Diamond D. M., et al. "The Temporal Dynamics Model of Emotional Memory Processing: A Synthesis on the Neurobiological Basis of Stress-Induced Amnesia, Flashbulb and Traumatic Memories, and the Yerkes-Dodson Law." *Neural Plasticity* 33 (2007). [dx.doi.org/10.1155/2007/60803](https://doi.org/10.1155/2007/60803).

Take a test - if introvert, drink coffee in pm
If extravert - drink coffee in am

Brain regions in which local volume was significantly associated with (a) Extraversion, (b) Conscientiousness, (c) Neuroticism, and (d) Agreeableness



Emotional Experience



Images from the International Affective Picture System removed due to copyright restrictions.

Extraversion as a Fundamental Dimension Of Human Personality

Introvert

Extravert



reserved

sociable

quiet

talkative

aloof

affectionate

task-

person-

oriented

oriented

serious

fun-loving

- Report more Positive Experiences
- Susceptible to Positive Mood Induction

Experimental Design

1 scan = 5 cycles

1 cycle = 4 negative, 4 positive pictures

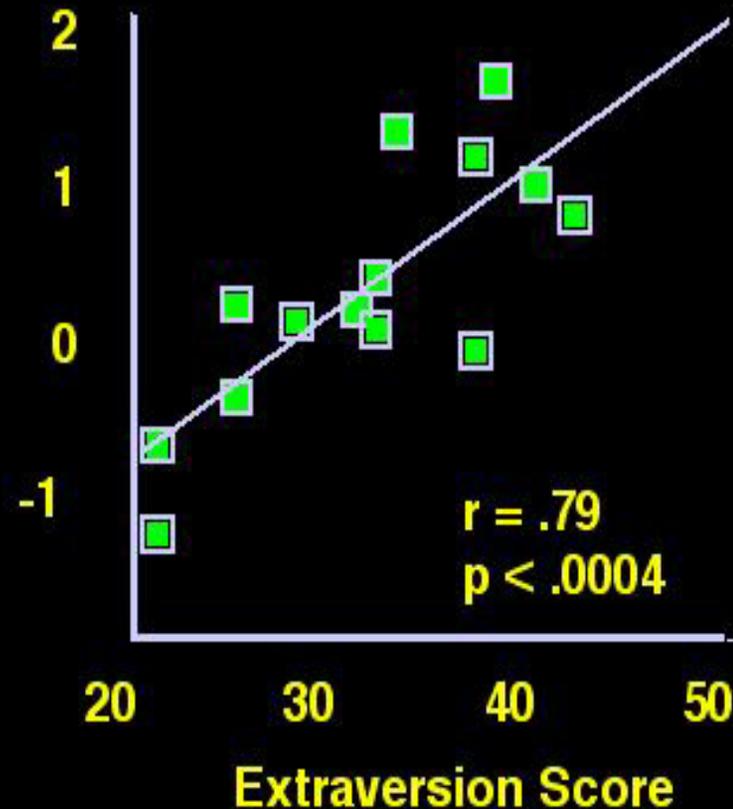
1 picture displayed for 7.5 seconds each

Amygdala Reactivity to Positive Pictures Correlates with Extraversion

Greater Activation
to Positive Pictures



Greater Activation
to Negative Pictures



Experimental Design



... 10 x

Fear

Neutral

Sad

Scrambled

Angry

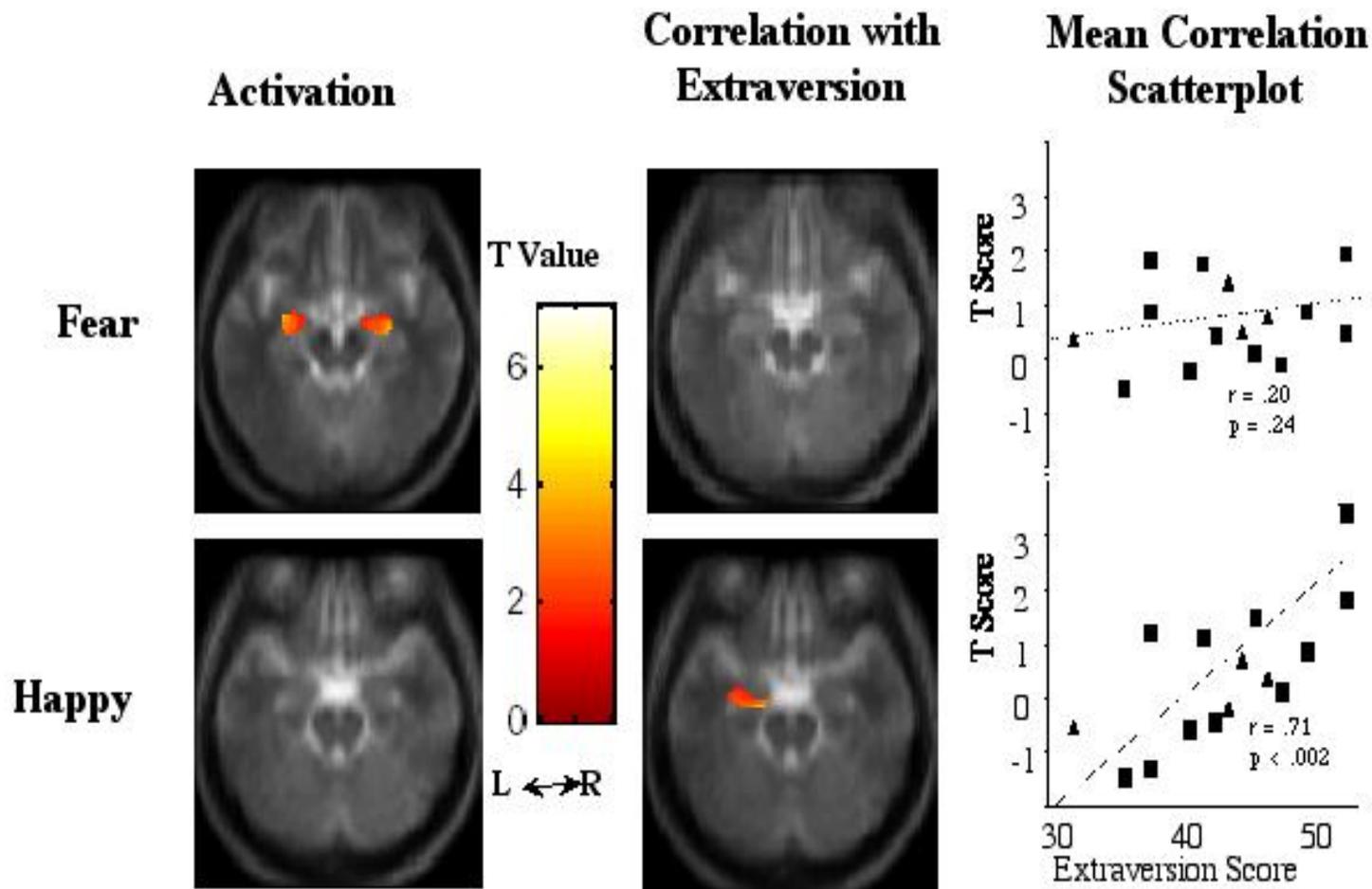
Happy

... 3 x

1 Scan = 3 Cycles

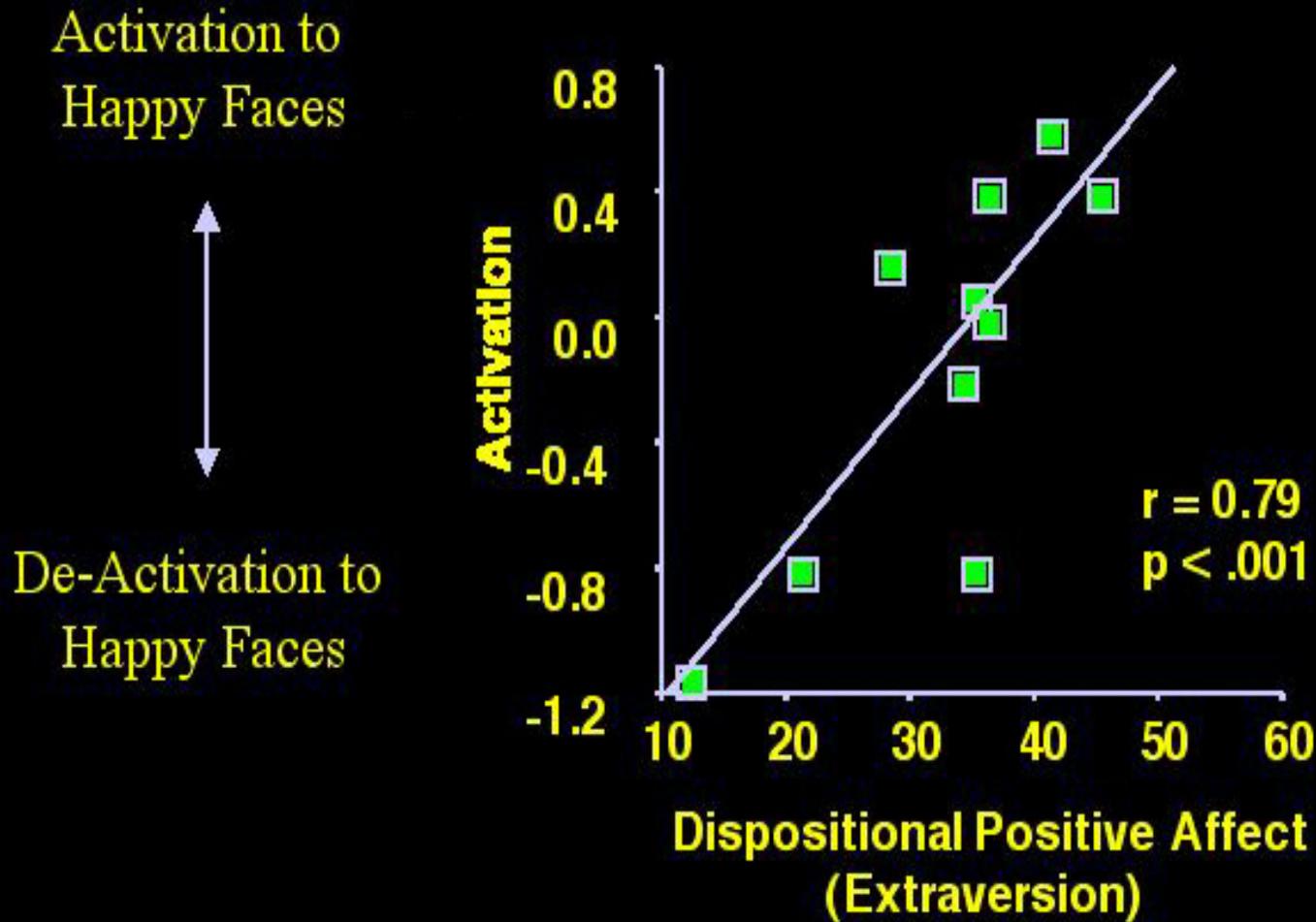
1 Cycle = 6 Emotion Conditions, 10 pics

1 Picture displayed for 3 sec each



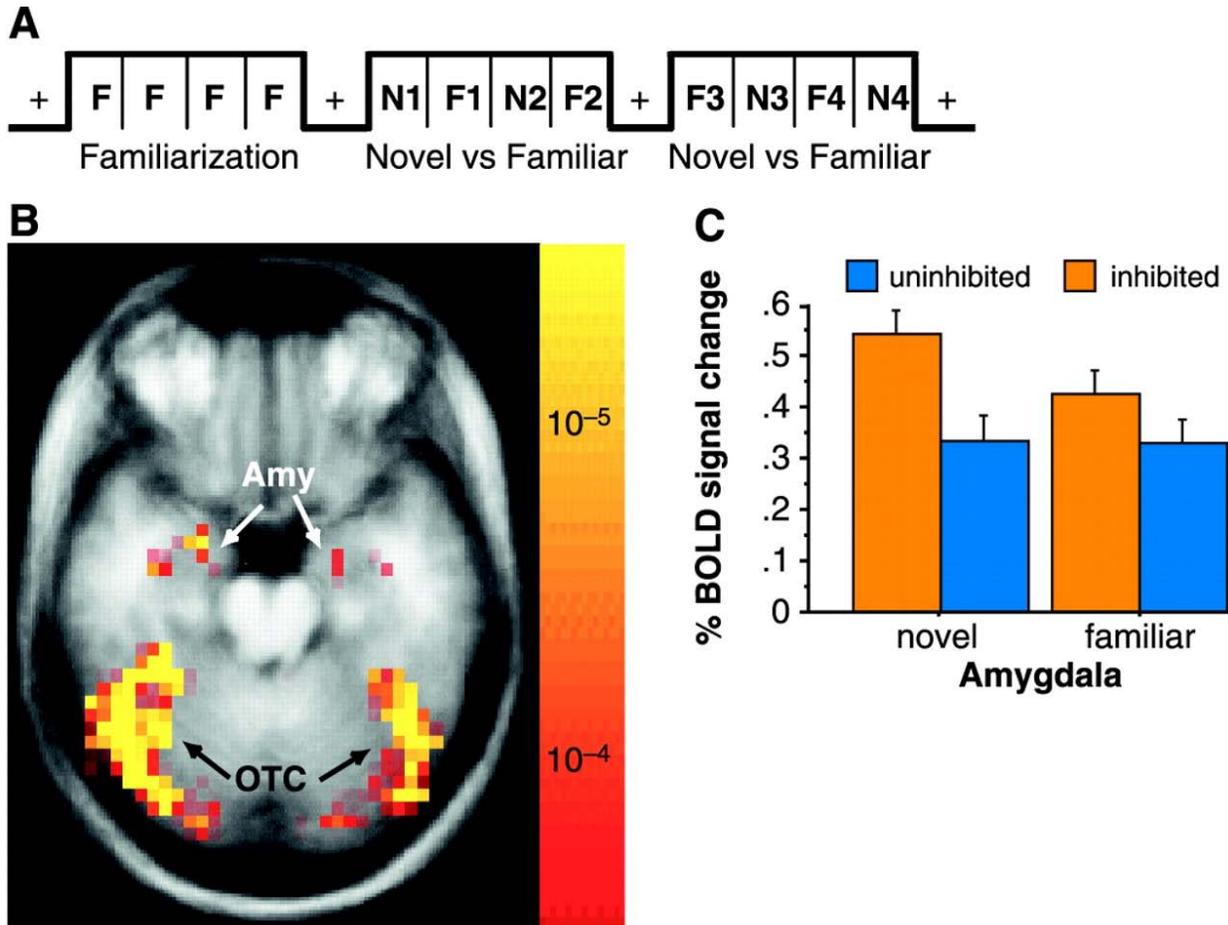
© Blackwell Publishing. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/fairuse>. Source: Adapted from Canli, T. "Functional Brain Mapping of Extraversion and Neuroticism: Learning from Individual Differences in Emotion Processing." *Journal of Personality* 72, no. 6 (2004): 1105-32.

Amygdala Reactivity to Happy Faces Correlates with Extraversion



Courtesy of American Psychological Association. Used with permission. Source: Canli, T., et al. "An fMRI Study of Personality Influences on Brain Reactivity to Emotional Stimuli." *Behavioral Neuroscience* 115, no. 1 (2001): 33-42.

Inhibited and uninhibited infants “grow up”: Adult amygdalar response to novelty



© AAAS. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/fairuse>. Source: Schwartz, C., et al. "Inhibited and Uninhibited Infants 'Grown Up': Adult Amygdalar Response to Novelty." *Science* 300, no. 5627 (2003): 1952-53.

Spielberger State and Trait Anxiety

Example

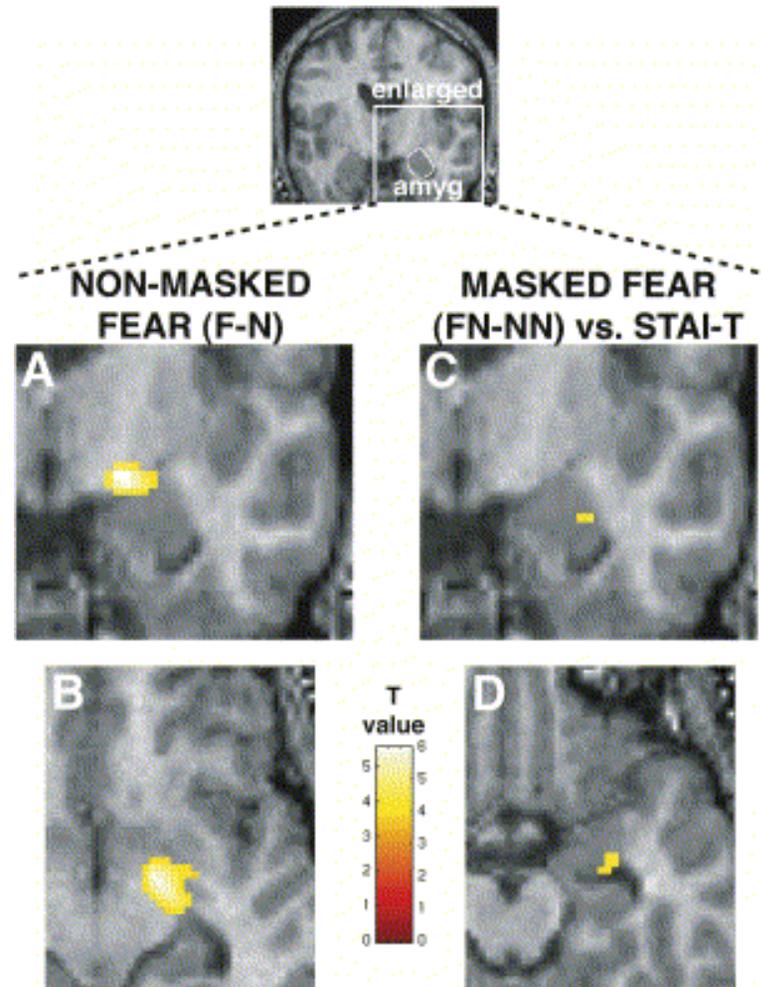
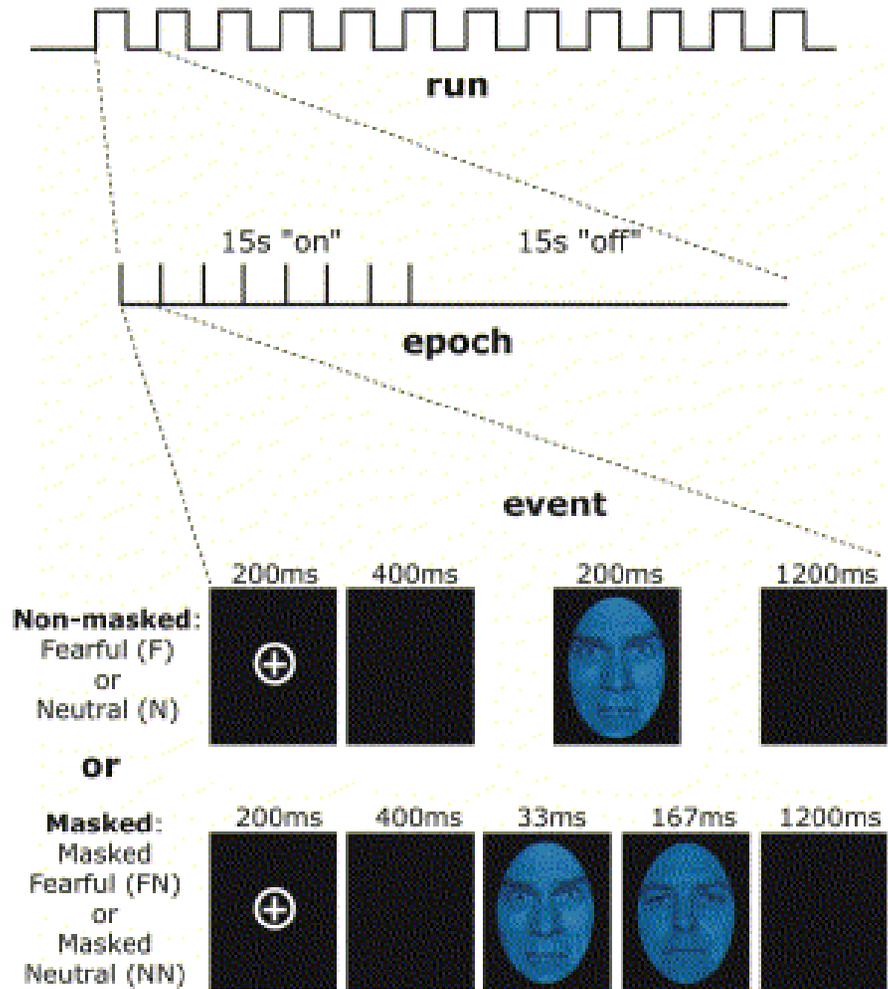
The **S-Anxiety scale** consists of twenty statements that evaluate how respondents feel "right now, at this moment."

	1	2	3	4
	Not At All	Somewhat	Moderately So	Very Much So
A. I feel at ease	1	2	3	4
B. I feel upset	1	2	3	4

The **T-Anxiety scale** consists of twenty statements that assess how respondents feel "generally."

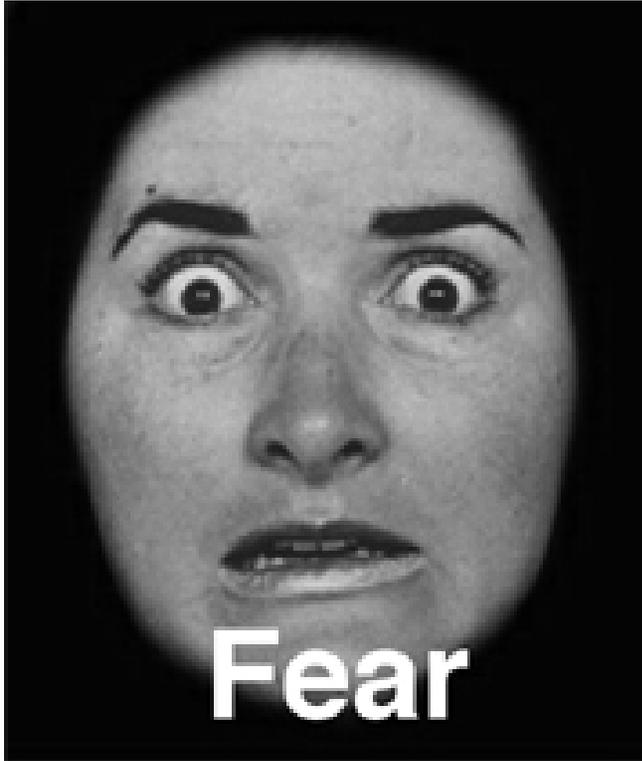
	1	2	3	4
	Almost Never	Sometimes	Often	Almost Always
A. I am a steady person	1	2	3	4
B. I lack self-confidence	1	2	3	4

Individual differences in trait anxiety predict the response of the basolateral amygdala to unconsciously processed fearful faces



Courtesy of Elsevier, Inc., <http://www.sciencedirect.com>. Used with permission. Source: Etkin, A., et al. "Individual Differences in Trait Anxiety Predict the Response of the Basolateral Amygdala to Unconsciously Processed Fearful Face." *Neuron* 44, no. 6 (2004): 1043-55.

Human amygdala: Impaired recognition of fear



- Intact face recognition
- Impairment selective for fear

Reprinted by permission from Macmillan Publishers Ltd: Nature Neuroscience.
Source: Susskind, J., et al. "Expressing Fear Enhances Sensory Acquisition."
Nature Neuroscience 11, no. 7 (2008): 843-50. © 2008.

Genetics & fMRI

SNPs - single nucleotide polymorphisms

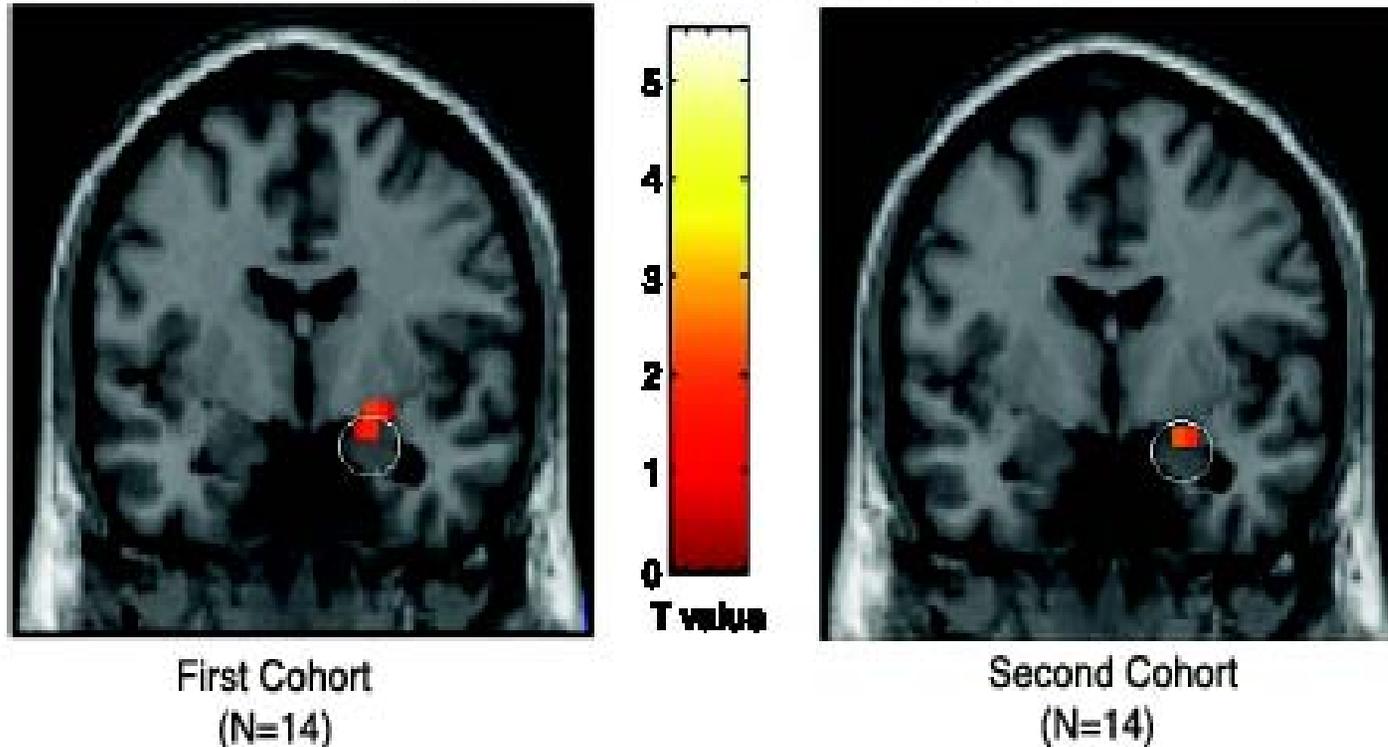
- **DNA sequence variation of a single nucleotide
adenine (A), thymine (T), cytosine (C), guanine (G)**
- **at least 1% of the population**
- **make up 90% of human genetic variation**
- **constant from generation to generation**

Genetic Variation in Amygdala Response

(Hariri et al., 2002)

- Short vs. long allele in variable repeat sequence of promoter region of serotonin transport gene
- Short allele associated with anxiety traits
- Greater response to fearful faces in short allele

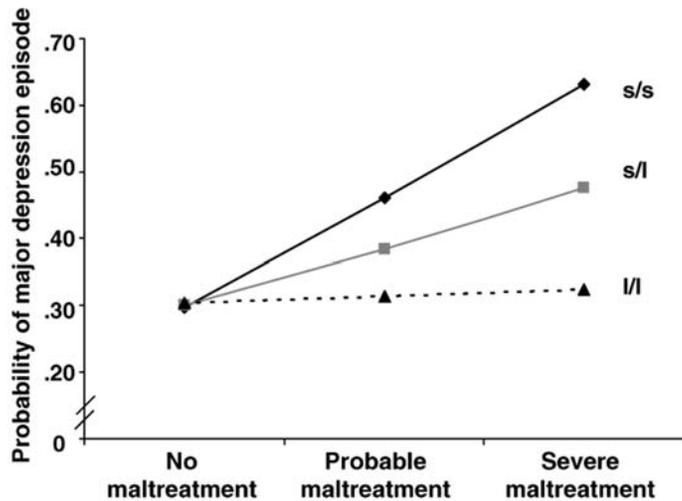
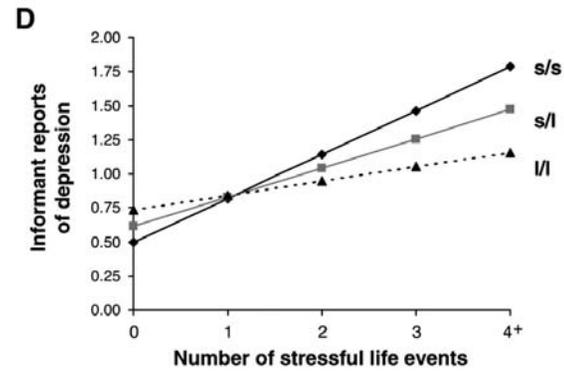
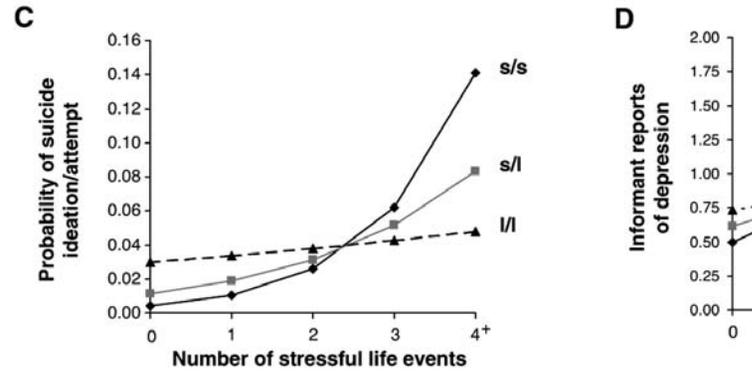
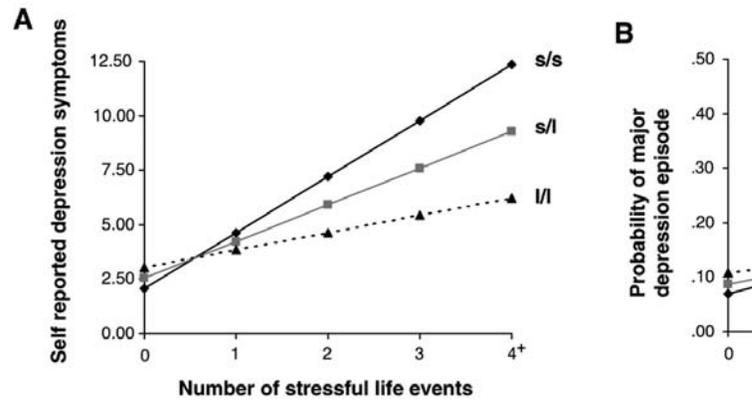
Amygdala Response: s Group > l Group



GENE X EXPERIENCE INTERACTION

- **Caspi, 2003**
- **polymorphism of 5-HTT gene**
- **stressful life events (ages 21-26; job, money, housing, health, relationships)**
- **childhood maltreatment (ages 3-11)**
- **short version of allele - more depression and suicidality in response to stressful events than those homozygous for long allele (not always replicated)**

Alleles
 s/s
 s/l
 l/l



© AAAS. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <http://ocw.mit.edu/fairuse>. Source: Caspi, A., et al. "Influence of Life Stress on Depression: Moderation By a Polymorphism in the 5-HTT Gene." *Science* 301, no. 5631 (2003): 386-89.

EXAM 2

- **70 points**
- **range 68-34**
- **mean = 56.5**

Rough grade distribution

$$\mathbf{A = 68 - 57}$$

$$\mathbf{B = 56 - 50}$$

$$\mathbf{C = 49 - 34}$$

MIT OpenCourseWare
<http://ocw.mit.edu>

9.00SC Introduction to Psychology
Fall 2011

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.